

PHALLODRILUS HESSLERI, NEW SPECIES
(OLIGOCHAETA: TUBIFICIDAE), FROM ABYSSAL
DEPTHS IN THE WESTERN PACIFIC OCEAN

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Abstract.—*Phallodrilus hessleri* is described from abyssal clay at 5916 m depth east of the Philippines. It is characterized by (1) slender, sharply pointed somatic setae with very thin (or absent?) upper teeth, (2) somewhat sigmoid penial setae in segment XI, 2 per bundle, and (3) very small, spindle-shaped atria. The species represents the second deepest record of marine oligochaetes in the world.

In a collection of benthic invertebrates from a deep-sea area near the Philippine Trench in the western Pacific Ocean, deposited in the National Museum of Natural History (USNM), Washington, D.C., the author found one well preserved individual of a new species of *Phallodrilus* Pierantoni, 1902 from a station almost 6000 m deep. Oligochaetes from such great depths are indeed rare. It was therefore considered appropriate to describe the species on the basis of this specimen.

The worm was stained in paracarmin and mounted whole in Canada balsam.

Phallodrilus hessleri, new species
Fig. 1

Holotype.—USNM 104128, whole-mounted specimen from E of the Philippine Trench, West Pacific Ocean, 9°06.0'N, 127°43.6'E, 5916 m, abyssal red clay (13 Mar 1975).

Etymology.—Named for Dr. Robert R. Hessler (Scripps Institution of Oceanography, La Jolla, California), who collected the sample.

Description.—Length more than 2.5 mm, more than 16 segments (worm not complete). Width at XI (compressed) 0.22 mm. Prostomium large, rounded. Body wall bearing scattered, very small particles. Clitellum extending over ½X–XII. Somatic se-

tae (Fig. 1A, B) bifid, with teeth almost parallel, upper tooth shorter and much thinner than lower, sometimes not visible (or absent?; cf. right bundle in Fig. 1B). Bifids 50–85 μ m long, 1.5–2.5 μ m thick at node, three to four per bundle anteriorly, two (or three) per bundle in postclitellar segments. Penial setae (Fig. 1C, D, ps) two per bundle, somewhat sigmoid, sharply single-pointed, 65–75 μ m long, about 3 μ m thick at node, directed in an almost antero-posterior direction. Male pores inconspicuous, paired ventrally and posteriorly in XI. Spermathecal pores paired, in line with ventral setae(?) in anteriormost X.

Pharyngeal glands in IV–VII. Male genitalia (Fig. 1D) paired. Vas deferens 8–10 μ m wide, coiled, much longer than atrium, entering apical end of latter. Atrium pear-shaped, about 60 μ m long, 28–33 μ m wide, with very thin outer lining and ciliated inner epithelium; latter densely granulated in ectal, wide part of atrium. Prostate glands compact, round, one at each end of atrium. Atrium opening to exterior through simple pore; penis or pseudopenis absent. Spermathecae (Fig. 1D, s) not seen in their full length (hidden behind gut), but consisting of short, narrow duct, and slender ampulla.

Remarks.—The diagnostic characters of this species are (1) the slender, sharply pointed somatic setae with very thin upper

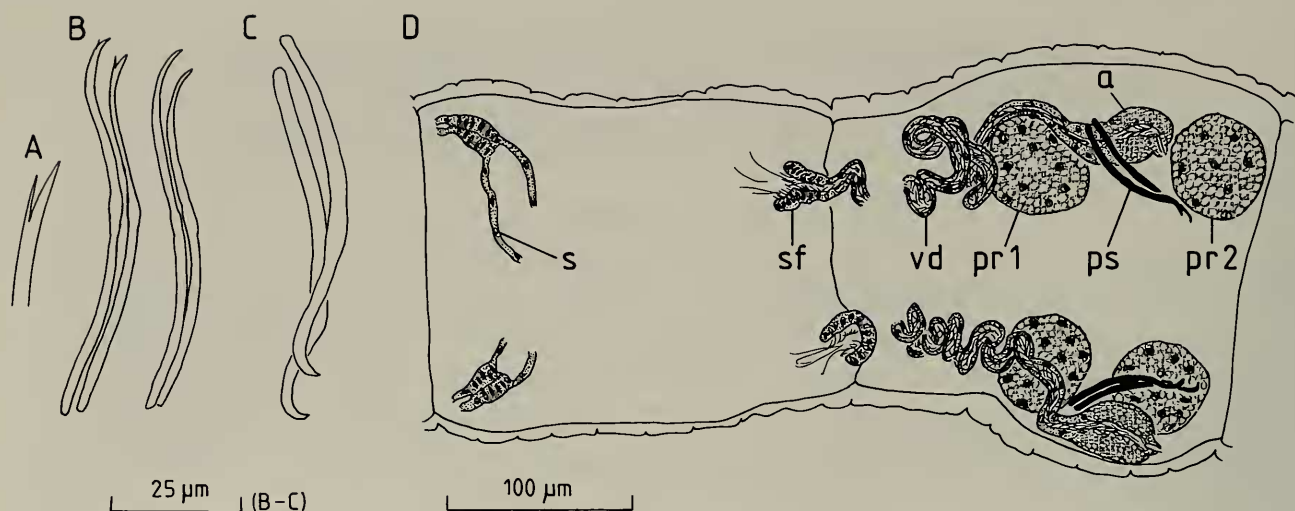


Fig. 1. *Phallodrilus hessleri*: A, Free-hand drawing of tip of somatic seta; B, Two bundles of somatic setae (from postclitellar segments); C, Penial setae; D, Horizontal view of spermathecae (only parts visible) and male genitalia in segments X–XI. Abbreviations: a, atrium; pr 1, anterior prostate gland; pr 2, posterior prostate gland; ps, penial seta; s, spermatheca; sf, sperm funnel; vd, vas deferens.

teeth (or sometimes absent?), (2) the bisetal penial bundles, and (3) the small atria. Other species within the genus with similar features are all deep-sea forms, viz. *P. profundus* Cook, 1970 (N Atlantic), *P. remus* Erséus, 1979 (NW Atlantic), *P. altus* Erséus, 1980 (Beaufort Sea, Arctic), and *P. segonzaci* Erséus, 1986 (S Indian Ocean), and they are probably the closest relatives of *P. hessleri*. However, in all these other species, the penial setae are clearly longer than the somatic setae (setae about equally long in *hessleri*). The new species is further distinguished from all of them except *P. remus* by its very short atria (atria not very large, but elongate in the others), from *P. remus* by the shape of its penial setae (those of *remus* oar-shaped, with wide inner ends), and from *P. profundus* and *P. segonzaci* by its lack of modified genital setae in segments IX and X.

Distribution and habitat.—Known only from the type-locality E of the Philippines, W Pacific Ocean. Abyssal clay, 5916 m.

Discussion

More than 30 species of Tubificidae have been described from the deep sea, all within the last 20 years (Cook 1970a, b; Erséus

1979a, b, 1980, 1982a, b, 1983a–c, 1984, 1986, 1988; see also review by Erséus 1985). Most of them are bathyal forms, but four are known from depths greater than 4000 m: the North Atlantic *Bathydrylus atlanticus* Erséus, 1979 (depth range 1600–4632 m; Erséus 1983), the two Indian Ocean species *Phallodrilus segonzaci* and *P. stilus* Erséus, 1986, both from a single station at 4910 m (Erséus 1986), and the North Pacific *B. hadalis* Erséus, 1979, which was collected at 7298 m in the Aleutian Trench (Erséus 1979a). *Phallodrilus hessleri* (from 5916 m) thus represents the second deepest record of marine oligochaetes in the world.

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